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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,205	07/02/2001	Kevin R. Lensing	2000.071900	2053

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EXAMINER

KOYAMA, KUMIKO C

ART UNIT PAPER NUMBER

2876

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,205

Applicant(s)

LENSING, KEVIN R.

Examiner

Kumiko C. Koyama

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Acknowledgement is made of receipt of Response filed on April 28, 2003.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-56 of U.S. Patent No. 6,383,824 in view of U.S. Patent No. 6,479,200.

Re claim 1 of the instant claimed invention: Claim 1 of the present invention recites,

"A method, comprising:

forming at least one grating structure in a layer of photoresist material, said grating structure being comprised of a plurality of photoresist features of a first size;
performing an etching process on said photoresist features of said at least one grating structure to reduce said photoresist features to a second size that is less than said first size;

illuminating the at least one grating structure;

measuring light reflected off of said grating structure after said etching process is started to generate an optical characteristic trace for said grating structure;

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comparing said generated optical characteristic trace to a target optical characteristic trace that corresponds to a grating structure comprised of a plurality of photoresist features having a desired profile; and
stopping said etching process based upon said comparison of said generated trace and said target trace.”

In 6,383,824 Patent, the Applicant claims,

“A method, comprising:

forming at least one grating structure above a substrate;
performing a deposition process to form a process layer above said grating structure;
illuminating said process layer and said at least one grating structure;
measuring light reflected off of said process layer and said at least one grating structure after said deposition process is started to generate an optical characteristic trace for said process layer and said grating structure;
comparing said generated optical characteristic trace to a target optical characteristic trace that corresponds to a process layer having a desired surface profile;
and
stopping said deposition process based upon said comparison of said generated trace and said target trace.”

6,383,824 Patent fails to claim that the grating structure is formed in a layer of photoresist material.

In Patent No. 6,479,200, Stirton discloses a method comprising forming a plurality of grating structures in a layer of photoresist, each of said formed grating structures being comprised of a plurality of photoresist features (col 12 lines 23-26). Stirton teaches that photoresist etching process may be performed to further reduce the size of the photoresist features (col 2 lines 57-59). Stirton also discloses a method comprising illuminating each of said formed grating structures (col 12 line 27), measuring light reflected off of each of said plurality of formed grating structures to generate an optical characteristic trace for each of said plurality of formed grating structures (col 12 lines 28-32), and comparing each of said generated optical characteristic traces to at least one optical characteristic trace from the library of optical

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characteristic traces, each of which corresponds to a grating structure comprised of a plurality of photoresist features having a known profile (col 12 lines 33-35, lines 19-22).

Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to integrate the 6,479,200 Patent claim to the 6,383,824 Patent to form a grating structure in a layer of photoresist material in order to provide a more accurate pattern, which leads to a better quality and reliable product and device.

Response to Arguments

3. Applicant's arguments filed on April 28, 2003 have been fully considered but they are not persuasive.

The Applicant submitted that "the inventions claimed in the present application are not obvious in view of the claimed inventions of either Lensing or Stirton," however, the examiner respectfully disagrees.

The Applicant argues that "...there are some very fundamental difference between the claimed invention of Lensing and Stirton and the claimed inventions of the pending application...the claims of the present application are generally directed to a method of stopping an etching process performed on a plurality of photoresist features...the claims of the Lensing patent are generally directed to methods of controlling and stopping a deposition process that is performed to form a process layer above a grating structure..." However, the present application and the Lensing's Patent No. 6,383,824 (herein after Lensing '824) claim almost the same invention with very few differences, which leads to the conclusion of judicially-created doctrine of obviousness-type double patenting rejection, not a statutory double patenting rejection. Both

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the present application and Lensing '824 claims forming at least one grating structure, illuminating the grating structure, measuring light reflected off the grating structure after a process is started to generate an optical characteristic trace for the grating structure, and comparing the optical characteristic trace to a target optical characteristic trace that corresponds to a desired profile.

On the other hand, as indicated by the Applicant, the differences between the present application and Lensing '824 is that the present invention is claiming a method for an etching process and the Lensing '824 is claiming a method for a deposition process. However, both the present application and Lensing '824 is claiming the method of using scatterometry measurements including the steps of forming, illuminating, measuring and comparing, as indicated above. Therefore, whether the method of using scatterometry measurements is used for an etching to reduce or a deposition process to form, it is obvious to utilize the patented method of using scatterometry measurements for other well known processes relating to semiconductor fabrication technology.

Allowable Subject Matter

4. Claims 1-80 would be allowable upon the timely filing of a terminal disclaimer to overcome the Non-statutory Double Patenting rejection as set forth above.
5. The following is an examiner's statement of reasons for allowance:

The best prior art of record Stirton discloses a method comprising forming a plurality of grating structures in a layer of photoresist, each of said formed grating structures being comprised of a plurality of photoresist features (col 12 lines 23-26). Stirton teaches that

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photoresist etching process may be performed to further reduce the size of the photoresist features (col 2 lines 57-59). Stirton also discloses a method comprising illuminating each of said formed grating structures (col 12 line 27), measuring light reflected off of each of said plurality of formed grating structures to generate an optical characteristic trace for each of said plurality of formed grating structures (col 12 lines 28-32), and comparing each of said generated optical characteristic traces to at least one optical characteristic trace from the library of optical characteristic traces, each of which corresponds to a grating structure comprised of a plurality of photoresist features having a known profile (col 12 lines 33-35, lines 19-22).

Stirton fails to specifically teach a method for stopping etching process based upon the comparison of at least one of the generated traces and the target traces, a method comprising measuring light reflected off of each of said plurality of grating structures after the etching process is started to generate an optical characteristic trace for each of the plurality of grating structures and a method comprising measuring light reflected off of the grating structure during the etching process to generate an optical characteristic trace for the grating structure.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kumiko C. Koyama whose telephone number is 703-305-5425. The examiner can normally be reached on Monday-Friday 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Kumiko C. Koyama

Kumiko C. Koyama
July 2, 2003

[Signature]
MICHAEL G. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800